

ABSTRACT OF THE DISCLOSURE

A p-type semiconductor includes a host material that is a semiconductor, an acceptor element and a localized band formation element. The acceptor element is doped to the host material and
5 has fewer valence electrons than valance electrons of at least one of the elements which compose the host material. The localized band formation element is doped to the host material, is isovalent with at least one of the elements which compose the host material, has smaller electronegativity than the electronegativity of the
10 element(s), and forms the localized band which activates holes of an acceptor level.